

**What is claimed is:**

1. A method for producing an article coated with a zirconium compound film characterized in that a zirconium target containing a metal of which the sputtering yield in an argon atmosphere is more than twice that of zirconium is used when the zirconium compound film is formed (deposited) by a reactive sputtering process on a substrate.
2. The method for producing an article coated with a zirconium compound film according to claim 1, wherein 1 - 45 at% of the metal is included in the zirconium target containing the metal.
3. The method for producing an article coated with a zirconium compound film according to claim 1, wherein 1 - 30 at% of the metal is included in the zirconium target containing the metal.
4. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 3, wherein a main material of the zirconium target containing the metal is at least one of a metallic zirconium and a carbon-containing zirconium.
5. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 4, wherein the metal is at least a kind of metal selected from a group consisting of tin, zinc and indium.
6. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 5, wherein a third metal other than the zirconium and the metal is included in the zirconium target containing the metal.
7. The method for producing an article coated with a zirconium compound film according to claim 6, wherein the third metal other than the zirconium and the metal is at least a kind of metal selected from a group consisting of calcium, yttrium, magnesium and neodymium.
8. The method for producing an article coated with a zirconium compound film according to claim 6 or claim 7, wherein the content of the third metal in the zirconium target containing the metal is 0.1 - 45 at%.

9. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 9, wherein the zirconium compound is a zirconium oxide.
10. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 8, wherein the zirconium compound is a zirconium nitride or a zirconium oxide-nitride.
11. The method for producing an article coated with a zirconium compound film according to any one of claims 1 through 10, wherein a substrate coated with the film is a plate-shaped glass.
12. The method for producing an article coated with a zirconium compound film, wherein a zirconium compound film is formed on a substrate coated with a crystallized zirconium oxide film by the method according to any one of claims 1 through 11.
13. The method for producing an article coated with a zirconium compound film having a photocatalytic function or an optical function, wherein a titanium compound film is formed by a sputtering process on the zirconium compound film formed by the method according to any one of claims 1 through 12.
14. The method for producing an article coated with a zirconium compound film having the photocatalytic function or the optical function according to claim 13, wherein the titanium compound film is a titanium oxide film, a titanium nitride film or a titanium oxide-nitride film.
15. The article coated with a zirconium compound film produced by the method according to any one of claims 1 through 12.
16. The article coated with a zirconium compound film having the photocatalytic function or the optical function produced by the method according to claim 13 or claim 14.
17. The article coated with a zirconium compound film containing a metal of which the sputtering yield in an argon atmosphere is more than twice that of zirconium.
18. The article coated with a zirconium compound film according to claim 17, wherein

the content of the metal in the zirconium compound film is 1 - 45 at% in metal percentage.

19. The article coated with a zirconium compound film according to claim 17, wherein the content of the metal in the zirconium compound film is 1 - 30 at% in metal percentage.

20. The article coated with a zirconium compound film according to any one of claims 17 through 19, wherein the metal is at least a kind of metal selected from a group consisting of tin, zinc and indium.

21. The article coated with a zirconium compound film according to any one of claims 17 through 20, wherein the zirconium compound is a crystalline compound.

22. The article coated with a zirconium compound film according to claim 21, wherein the zirconium compound is a crystalline compound of a monoclinic system.

23. The article coated with a zirconium compound film according to any one of claims 17 through 22, wherein the zirconium compound is a zirconium oxide.

24. The article coated with a zirconium compound film, wherein a crystalline zirconium oxide film is provided between a substrate and the zirconium compound film according to any one of claims 17 through 23.

25. The article coated with a zirconium compound film according to any one of claims 17 through 24, wherein the substrate of the article coated with the zirconium compound film is a plate-shaped glass.

26. The article coated with a zirconium compound film having a photocatalytic function or an optical function, wherein a titanium compound film is provided on the zirconium compound film according to any one of claims 17 through 25.

27. The article coated with a zirconium compound film having the photocatalytic function or the optical function according to claim 26, wherein the titanium compound film is a titanium oxide film, a titanium nitride film or a titanium oxide-nitride film.

28. A sputtering target containing a metal of which the sputtering yield in an argon atmosphere is more than twice that of zirconium in a target used for forming

- (depositing) a zirconium compound film on a substrate by a reactive sputtering process.
29. The sputtering target according to claim 28, wherein the content of the metal in the zirconium target is 1 - 45 at% in metal percentage.
- 5 30. The sputtering target according to claim 28, wherein the content of the metal in the zirconium target is 1 - 30 at% in metal percentage.
31. The sputtering target according to any one of claims 26 through 30, wherein a main material of the zirconium target containing the metal is at least one of metallic zirconium and carbon-containing zirconium.
- 10 32. The sputtering target according to any one of claims 26 through 30, wherein the metal is at least a kind of metal selected from a group consisting of tin, zinc and indium.
33. The sputtering target according to any one of claims 26 through 32, wherein a third metal other than the zirconium and the metal is included in the sputtering target
- 15 containing the metal.
34. The sputtering target according to claim 33, wherein the content of the third metal is 0.1 - 45 at%.
35. The sputtering target according to claim 33 or claim 34, wherein the third metal is at least a kind of metal selected from a group consisting of calcium, yttrium,
- 20 magnesium and neodymium.